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Title : Dynamics Of The Eastern Spinner Dolphin and The Northeastern Offshore Spotted Dolphin Populations: Are They Recovering?

Category : Conservation

Student :

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Abstract : The dynamics of the northeastern offshore spotted dolphin (*Stenella attenuata*) and the eastern spinner dolphin (*S. longirostris orientalis*) populations in the eastern tropical Pacific were assessed by fitting models to twelve abundance estimates (1979-2000). Estimates were made of both exponential growth (r) for 1979-2000 and the maximum growth rate (R_{max}), assuming a density-dependent (DD) model. Additional models were considered, including temporal changes in r (2- r) and carrying capacity (2- K), and an age-structured model. Models were compared using the Bayes factor.

The estimate of r for the eastern spinner dolphin was low, 0.010 (-0.013, 0.035). The 2- r model fit the data slightly better, but was only twice as likely as the single r model. The 2- r model estimated the population was initially increasing at 0.040 (-0.015, 0.078) and then in ~1990 declined to a rate of change of -0.021 (-0.077, 0.041). Under the DD model, R_{max} was estimated to be 0.014 (0.001, 0.052). There was no support for the 2- K model. Results were similar for the spotted dolphin, with r estimated at 0.017 (-0.001, 0.036), and the 2- r model estimating the initial rate of change as 0.026 (-0.066, 0.071), declining to 0.002 (-0.090, 0.059).

For both populations, the age-structured model gave similar results. Models assuming a large underestimation of fishery-caused mortality were not supported. The data were not sufficient to draw definitive conclusions, but the results suggest that for either population (1) rates of increase overall were ~1-2% per year, which is lower than expected, or (2) rates of increase were initially as expected, but declined after ~1990. Use of a fisheries observer based abundance index strengthened these conclusions, but the validity of that index has been questioned. An import caveat is that estimates of population growth will be biased low if not all sources of human-caused mortality were accounted for.